

PROJECT NUMBER: 1806
PROJECT TITLE: New Tobacco Processes
SECTION LEADER: S. R. Wagoner
PERIOD COVERED: June, 1989

I. PROJECT ART - COMMERCIAL PROCESS DEVELOPMENT

- A. **Objective:** To conduct trials providing information for development of the ART commercial process.
- B. **Results:** To investigate the cigarette spotting issue, the operation of the Bermuda Hundred Hauni tunnel on the extracted filler line was examined to determine its performance relative to the Semiworks. Upon inspection, BH engineers discovered, and immediately corrected, a faulty solenoid on the tunnel condensate line. In addition, it was found that the distribution of filler to the BH tunnel was somewhat less uniform than in the Semiworks, that the filler residence time in the BH tunnel was less than in the Semiworks tunnel, and that the steam to filler ratio was lower at BH. To date, the residence time has been increased to approximately 30 seconds by installing a variable speed drive, and additional holes have been drilled in the BH tunnel to increase the steam to filler ratio. Also, the uniformity of the feed to the tunnel has been significantly improved.

As the tunnel modifications were being made, several Semiworks trials were conducted with Bermuda Hundred filler to verify that the extraction step was causing the spotting and to compare tunnel processing at the two locations. Cigarettes made from fillers sampled immediately before and after extraction yielded SOLVIC spot values of 0 and 123 critical spots/2000 cig, respectively, demonstrating that the extraction step is producing the spotting potential. Semiworks trials were run producing finished filler, with and without tunnel treatment, from extracted material. These showed significant reductions in spot values for the tunnel treated models to levels comparable with past Pilot Plant results. All of the above testing was conducted on non-menthol models.

To address the menthol models, Bermuda Hundred filler was obtained for cigarette making and packaging in materials which targeted menthol loadings of 0, 86, and 100 mg/pack. SOLVIC analysis showed dramatic increases in the spotting levels for the latter two configurations.

In addition, testing of menthol models was conducted after the above tunnel modifications were completed. Finished filler was obtained from BH as was extracted filler that was processed into a final blend at the Semiworks, with and without tunnel treatment. Cigarette inspection (5 day aging) showed values of 94 critical spots/2000 cig for the BH filler, and 93 and 133 critical spots/2000 cig with and without Semiworks tunnel treatment.

As part of the program examining alternatives for expansion of extracted filler, the one liter facility conducted extraction runs

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on DIET, expanded DL blend, and a blend of 80% unexpanded DL/20% expanded DL to determine if any cylinder volume collapse occurred during extraction. Each material was run at two AB/OV target levels, 3.0%/26% and 1.3%/19%, and was sampled after AB application and after extraction. The CV (cc/g) values were:

	<u>DIET</u>	<u>Exp. DL</u>	<u>80% Unexp. DL/ 20% Exp. DL</u>
starting material	8.5	9.2	5.9
high AB/OV, cased	8.2	7.8	5.9
high AB/OV, extracted	6.5	6.8	5.6
low AB/OV, cased	8.3	7.7	6.0
low AB/OV, extracted	7.0	7.4	6.0

- C. Plans: Additional spotting analyses are being run comparing cigarettes made from filler processed through the BH tunnel versus the Semiworks tunnel. Also, trials have been conducted with BH filler in the Semiworks operating the tunnel at different residence times and tobacco throughputs. Spot data will be available next month.

To test the extraction of expanded materials on a larger scale, the Bermuda Hundred Pilot Plant made runs with the 80/20 blend and the 100% expanded DL. Data generation and analysis are continuing.

II. HAUNI HT TUNNEL EVALUATION

- A. Objective: Determine the effect of steam conditioning tobacco materials in the Hauni HT steam tunnel prior to drying.
- B. Results: The fourth (and final) test in the initial evaluation series was conducted processing Marlboro cut rag through the Semiworks Hauni tunnel to determine the effect of steam pressure on cigarette firmness. However, firmness testing has been delayed due to other priorities in the laboratory.
- C. Plans: Complete physical and subjective evaluations on all four tests.

III. TMCI-ASTA SHEET

- A. Objective: To develop a subjectively and physically acceptable reconstituted tobacco sheet using the TMCI process and PM-RCB technology for international application.
- B. Results: The Cadiz plant produced ASTA on one line in June. The plant will be shut down in July for rectification of problems on this line and completion of the second line. ASTA product from Cadiz has the same pinholed appearance as the Tarragona product from the same tobacco grind (120 mesh) and PM binder formulation. Doctoring of the sheet from the belt appeared to be acceptable as

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judged from the appearance of the underside of the sheet. The sheet dryer capacity has been reported by TSA to be only 50% of production capacity when casting slurry at 19% slurry solids (design 21%). However, there are still significant problems with the rub rails on the dryer steam boxes which are limiting factors in assessing the potential dryer capacity. A questionnaire was sent to TMCI in Cadiz to establish the status of outstanding mechanical questions and the quality of the process operation.

The measurement of feedstock bulk densities and drying rates of ASTA sheet made from various blends and grind sizes did not show major differences. This information was sent to TSA and TMCI who were concerned that blend changes might influence the performance of the Cadiz plant.

Air removal from ASTA slurry in the laboratory was confirmed to minimize pinholes in the sheet. Tensile strength, elongation and work to break values for the product from which air had been removed were increased by 30-50% for both ASTA and RCB. The density of the sheet was also increased by air removal. The ammonia content of the slurry was not measurably changed by the application of vacuum to the slurry to reduce its air content. Commercial equipment is available for rent to confirm these observations on a production line.

The measurement of survivability of ASTA filler from laboratory handsheets by sieve analysis was found to be unrepresentative for filler from the finest tobacco grind. This product has a very smooth plastic appearance and the filler which was ~1" long passed through the 6 and 12 mesh sieves. Another means of measurement of filler length is being sought.

- C. Plans: Discuss a production trial with BL Plant management for air removal from RCB slurry to improve sheet quality.

Support TSA in future Cadiz trials.

Develop an alternative means to sieve analysis of quantifying filler size of reconstituted tobacco.

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